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CLEVELAND, OHIO

WEST TECHNICAL HIGH SCHOOL, CLEVELAND

WEST TECHNICAL HIGH SCHOOL

BUILDING AND EQUIPMENT
WITH AN OUTLINE OF THE
COURSE OF STUDY

CLEVELAND, OHIO
1911

THE BOARD OF EDUCATION.

Organization for 1911.

Members.

Francis H. Haserot	John C. Canfield
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Francis H. Haserot ..... President
Charles Orr ..... Director of Schools
William H. Elson ..... Superintendent of Schools

Address all communications in regard to the West Technical High School to R. L. Short, Principal.

Statement of Building

The building, in the style of the French Renaissance, is a beautiful structure of dark shale brick, grey stone and terra cotta. The architect, Mr. F. S. Barnum, has succeeded in making this, as is ever essential in a school building, a glass building. The large amount of wall space given to glass, gives ample light without in any way detracting from the appearance of the building. Steel lockers throughout the building take the place of cloak rooms. The corridor floors are models of their kind. The telephone service reaches each room and is so wired that the office may communicate with all rooms at one time. A vacuum cleaning system which extends to every part of the building insures a clean school, free from dust. The boiler room contains a plant with a capacity of six hundred horse power. A complete light and power plant is installed. The fans deliver 171,000 cubic feet of air per minute, this fresh air being so distributed that each pupil is supplied with 54 cubic feet of fresh air per minute. This exceeds the hospital requirement of 50 cubic feet per minute. The air is moistened after being heated so that the proper amount of humidity is maintained. Foul air is taken out by a separate set of exhaust fans.

The general plan of the main part of the building is in the form of the letter E. The ground floor of the building covers about two acres. There are four stories, a basement and sub-basement in the center portion. The other portions of the building are three stories above the basements. The auditorium entrance to building is at the southwest corner. As one enters the center of the building on the first floor are found, to the right, the general and private offices while an exhibition room is on the left. Across the main corridor is the consultation room where teachers may meet pupils and parents.

The corridor running east from the central entrance leads to the general faculty rooms. These are the official home of the faculty. Here are found rest rooms, conversation rooms, and desk room for each teacher. The north wing of the first floor contains the cabinet shops, mill room and finishing room. Drafting rooms and physics lecture room and laboratory are in the corners of the building.

In the basements are the pattern shops, foundry, forge rooms, machine shops, cafe, kitchens, gymnasiums, shower

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rooms, and lockers, electrical construction department and kilns for pottery. Two mechanical drawing rooms and rooms for the heating and ventilating apparatus occupy the remainder of space on this floor.

The library floor is the second floor. Grouped around the library are recitation rooms that demand the greatest use of reference books. On this floor are the English, History, German rooms and the study halls. The middle section of the second floor is devoted to dressmaking, millinery, physiology and the girls' hospital.

With the exception of the mathematical rooms, the third floor is largely a laboratory floor; here are two chemical laboratories, a geography laboratory, two art rooms, the pottery and art metal rooms, two kitchens for domestic science, and a suite of rooms where the girls are taught to keep house.

On the fourth floor is a small auditorium with a seating capacity of two hundred, a print shop, a laundry and the Industrial Museums.

EQUIPMENT.

The building is equipped for 1,000 pupils. Each shop will care for 28 at a time. The pattern shops each contain 28 benches, 6 lathes, a grinder and band saw, with the necessary small tools. In the foundry is a two-ton cupola, a modern brass furnace, a core oven and tumbling barrel. There are 28 individual benches and a set of tools for each. The forge room has 29 modern down draft forges, a tempering furnace and a power hammer for illustrating drop forging, also power shears, hack saws, emery wheels and drills. The mill room is equipped with the most modern and powerful machinery to re-saw and prepare the lumber for use in the various shops. In the machine shops is modern heavy machinery for iron and steel work. Here are found the most approved types of lathes, shapers, planers, milling machines, grinders, drills and screw machines that are needed in modern manufacture. The drafting rooms are models of their kind, each pupil having his individual instruments which belong to the school. The lighting is indirect and of the most approved type. The electrical construction department is fitted up with 28 miniature rooms with complete equipment in which classes may work out the various problems assigned to them. The physics laboratory is planned for practical work in physics and is thoroughly

equipped for the study of machines and electricity. One chemical laboratory is arranged for agricultural and manufacturing chemistry, and the other for the chemistry of foods. The latter adjoins one of the kitchens. This enables a teacher of cooking to illustrate the chemistry of cooking by taking the pupils directly to the laboratory instead of passing them on to another teacher. The sewing and millinery rooms are well equipped with tables, machines and storage cases. The course prepares for either home or trade work. The art rooms are attractively fitted up and can be thrown together by means of folding doors. The kitchens are ideal. Each girl has her own stove, oven and complete kitchen outfit. The suite is completely but simply furnished. The equipment is suitable for the teaching of serving, table manners, housekeeping and home nursing. The greenhouse makes possible the continuance of agricultural and horticultural work during the winter months. The outdoor gymnasium and outdoor study hall lend an additional attraction to the school, an attraction which is not only a pleasure but a benefit. The gymnasiums are the most complete in the state. The main gymnasium has a floor space 101 x 65 feet, equipped with three sets of floor and suspended apparatus, a liberal supply of bells, clubs, wands and chest weights, an excellent cork covered running track and is arranged to care for such indoor games as basketball, baseball, hockey, volley ball and wrestling.

The smaller gymnasium, 41 x 52 feet, will be used for lighter exercises and artistic work and such corrective exercises as can best be handled off the main floor.

The dressing rooms are supplied with the best sanitary steel lockers and ample bathing facilities.

The outdoor gymnasium consists of a timbered roof supported by large concrete columns and enclosed by a wire netting, giving a clear floor space of 40 x 90 feet free of all obstructions.

The structure follows the lines of a Greek temple and will greatly add to the beauty of the school grounds.

The athletic field in lay-out and construction is second to none in this country. The quarter-mile cinder track, 16 feet wide and having a 150 yard straightaway 26 feet wide, is built according to the most approved methods and encloses two baseball diamonds, a football gridiron and numerous jumping pits. At one side are four regulation tennis courts properly built and drained.

On this field is a fine grandstand of concrete and iron construction with a seating capacity of 2,000. Beneath this structure are large dressing rooms equipped with benches, showers, and such other facilities as go to make a first class athletic field equipment.

AIM.

It is the aim of this school to afford a practical education to boys and girls who desire such, to aid those who wish help toward a trade, to prepare those who wish to enter higher technical schools and to offer to the girls in the household arts course an education which is invaluable to the homemaker. To both boys and girls the school dignifies and teaches the value of manual work. The various types of shops and laboratories afford wide choice in specialization. These include structural drafting, machine design, printing, pattern making, cabinet making, forging, machine shop practice, designing, catering, agriculture and horticulture, industrial chemistry, electrical construction and physical training. Pupils may specialize in the third and fourth years.

The night classes afford an excellent opportunity for those engaged in technical work to become more skillful along the lines in which they are interested. The school is open to all who meet its entrance requirements and who live west or south of the river.

THE SCHOOL DAY.

The school is in continuous session from 8.30 until 3:30 p. m., this time being divided into nine equal periods. Each pupil and teacher is given time during the middle of the day for luncheon, the lunch being eaten in the café, and may either be purchased there or brought from home. The café is under the supervision of the teachers of domestic science and many of the dishes of the luncheon are prepared by the pupils and sold in the café at cost.

BOYS' AND GIRLS' CLASSES.

In so far as is possible, boys and girls are given separate instruction. This is essential from the very nature of the courses offered, not only in technical but also in academic branches, and affords an opportunity to the teacher for special instruction not often found in other lines of teaching.

THE SCHOOL YEAR.

School is in session the entire year, the year being divided into four terms of twelve weeks each. To graduate, a pupil must complete twelve terms of work covering an assigned number of hours. This work may be taken continuously or by terms which suit the convenience of the pupil. If the work is taken continuously, the four years' course may be completed in three calendar years. The first year is the "D" year, the second the "C" year, the third the "B" and the fourth the "A." Three terms constitute a year's credit in any year.

THE LIBRARY.

This is directly under the direction of the Cleveland Public Library. The school is thus benefited by the expert advice and suggestions which library officials are able to give. Preparation has been made for a collection of 5,000 books and technical magazines. With the exception of the circulating books furnished by the city library, the collection is for reference work.

THE SCHOOL AND THE HOME.

In this school the relation of the home, the pupil and the teacher is exceptional. When a pupil enters the school he is assigned to a teacher who is to be his counselor and advisor for the entire time he is in school. Cordial relations are at once established. The teacher visits the home, knows the boys' surroundings, meets his parents, talks over the boy's future. By this means the teacher becomes the pupil's mentor, is responsible for his attendance, his scholarship, his course of study and has largely to do with his vocational guidance. Such organization means better understanding of the school by the home, fewer failures, smaller losses, a better comradeship, a better adaptation of the work to the boy and the boy to the work.

THE SCHOOL AND THE EMPLOYER.

The system of advisors maintained in the school is a great help to employers and to pupils seeking employment. In a limited way coöperation between the school and the employer is thus made possible. Many merchants and manufacturers are ready to employ intelligent boys and girls who have received technical training.

COURSE OF STUDY FOR BOYS

The daily session consists of nine periods of forty-five minutes each. School day 8:30 A. M. to 3:30 P. M.

Program by periods per week

First Year

Subject	Periods per week
English	5
Mathematics	5
Industrial Geography	5
Mechanical Drawing	6
Woodworking	10
Physical Training	4 or 3
Study	5 or 6
Lunch	5
	45

Second Year

English	5
Mathematics	5
Chemistry	6
Mechanical Drawing	4
Shop	10
Physical Training	4 or 3
Study	6 or 7
Lunch	5
	45

Third Year

English	5
Physics	6
German or French or Industrial History or Technical	5
Mechanical Drawing, one quarter	4
Shop, one quarter	10
Elective Technical, two quarters	14
Study	10
Lunch	5
	45

Fourth Year

Advanced Mathematics	5
American History and Civics	5
German or French or Elective Academic, or Technical (10)	5
Elective Technical	15
Study	10 or 5
Lunch	5
	45

In the third and fourth years pupils may elect 2 or 3 periods of Physical Training.

In the fourth year pupils may elect 2 periods of Sex Hygiene in place of 2 periods of Physical Training.

COURSE OF STUDY FOR GIRLS

The daily session consists of nine periods of forty-five minutes each. School day 8:30 A. M. to 3:30 P. M.
Program by periods per week

First Year

Subject	Periods per week
English	5
Mathematics	5
Botany and Physiology	5
Cooking	6
Sewing	4
Applied Art	6
Physical Training	4 or 3
Study	5 or 6
Lunch	5
	45

Second Year

English	5
Mathematics	5
Cooking and Chemistry	10
Sewing	6
Applied Art	4
Physical Training	4 or 3
Study	6 or 7
Lunch	5
	45

Third Year

English	5
History	5
Physics	6
German or French or Technical (10)	5
Elective Technical	15
Study	
Lunch	5
	45

Fourth Year

Art History and Civics	5
Advanced Science or German or French	5
Elective Academic or Technical (10)	5
Elective Technical	15
Study	
Lunch	5
	45

In the third and fourth years pupils may elect 2 or 3 periods of Physical Training.

In the fourth year pupils may elect 2 periods of Sex Hygiene in place of 2 periods of Physical Training.

THE COURSE OF STUDY.

Academic Work.

MATHEMATICS.

In this department the work is necessarily more exacting and difficult than in any other type of high school. Not only must the pupil have a good knowledge of theoretical and demonstrative mathematics but he must be able at any time to apply his mathematics to whatever problem arises in shop, kitchen or laboratory.

Speed and accuracy are a factor in this work. Technical teachers are in close touch with those of this department, and any deficiency on the part of the pupil is at once reported.

The scope of the work covers Arithmetic, Algebra, Geometry, and Trigonometry. Two years are required but three and one-third years are offered. This enables a pupil to prepare for any technical college.

ENGLISH.

The courses in English constantly strive toward two definite ends. First, an added care for the purity and precision of our speech and, second, a love for its literary masterpieces. Through acquaintance with the latter, the student has before him models from which he may unconsciously form his own style, if properly guided. More than this the work in literature is to serve practical ends. As a result of the student's three years' work in English, he should be so much at home in the world of books that he may be able to draw upon them with facility to meet the demands of daily life—draw upon them for business purposes for models and aids in letter-writing, speech-making, story telling and other forms of entertaining. The student should have learned in a general way what sources of information a good library affords, should know how to consult it for a variety of purposes, and how to hunt down expeditiously any reference that occurs in his daily reading. With the good reference library in school this may be accomplished.

The study of composition has an important place in the English work. Its purpose is plain enough. It is to help the student to express himself more fluently, more accurately, and more clearly than he otherwise would. The

topics chosen by the teacher are, as a rule, those relating to his work or experiences in some one of the departments of the school. Thus an effort is made to correlate the study of English with other subjects, and at the same time to arouse and sustain the interest of the student.

Generally, no particular provision is made in high school work for so-called oral composition, but it is the plan of this department to assign during the first year simple topics to the student in connection with his class reading and current topics. He is to be taught how to collect the material, and arrange it in an outline form from which to present it in the class room. After the student has acquired the ability to present topics with the aid of notes, he should be encouraged to speak without any of these aids. The same methods may be applied to the daily recitation. In fact, it is often best to begin by having the student outline the subject matter of the lesson and come to class prepared to recite upon any topic in the outline. In this manner the recitations in English and in practically all of the other subjects of the high school course may be used to give the student the necessary training in oral composition.

The fact must not be overlooked, however, that if good results in English training are to be secured, there must be a hearty coöperation between parent and teacher.

FIRST YEAR SCIENCE.

The course for girls includes Botany and Physiology: The Botany is of a general character. Beginning with the lowest forms of plant life, the pupil is gradually lead to understand the higher forms and their relation to the lower forms of animal life. Besides the value to the pupil thru Botany itself, and the help in understanding Physiology, this Botany work is helpful in Applied Art. The study of cell structure is helpful in its relation to various textiles.

Physiology occupies two-thirds of the year. This course is very thorough, and emphasis is laid on hygiene and personal physiology for women.

The course for boys is in Industrial Geography: The purpose of this course is to develop in the student the scientific habit of solving problems and to give him some knowledge of the geographical conditions which determine and control the industries of this country and of the leading nations with which our country carries on commerce.

The first two months are spent studying weather and climate. In this work the student becomes familiar with the methods and means of predicting weather and the value of such predictions. He also comes to know some of the conditions which determine climate and the influence which climate has on industries. This work is followed by a study of relief, drainage and soil, together with the agencies which modify their factors. Throughout the course much time is spent showing the relations between relief, drainage and soil, and the industries which are largely determined by them.

During the second half year the principles gained in the first half of the course are applied in a regional study of the industries of the United States, Canada, British Isles, Germany and France. This familiarizes the student with the leading industries of these countries, the reasons why they exist, the methods by which they are carried on and the lives of the people who are engaged in them.

The course is carried forward in a series of lectures, recitations, and laboratory exercises.

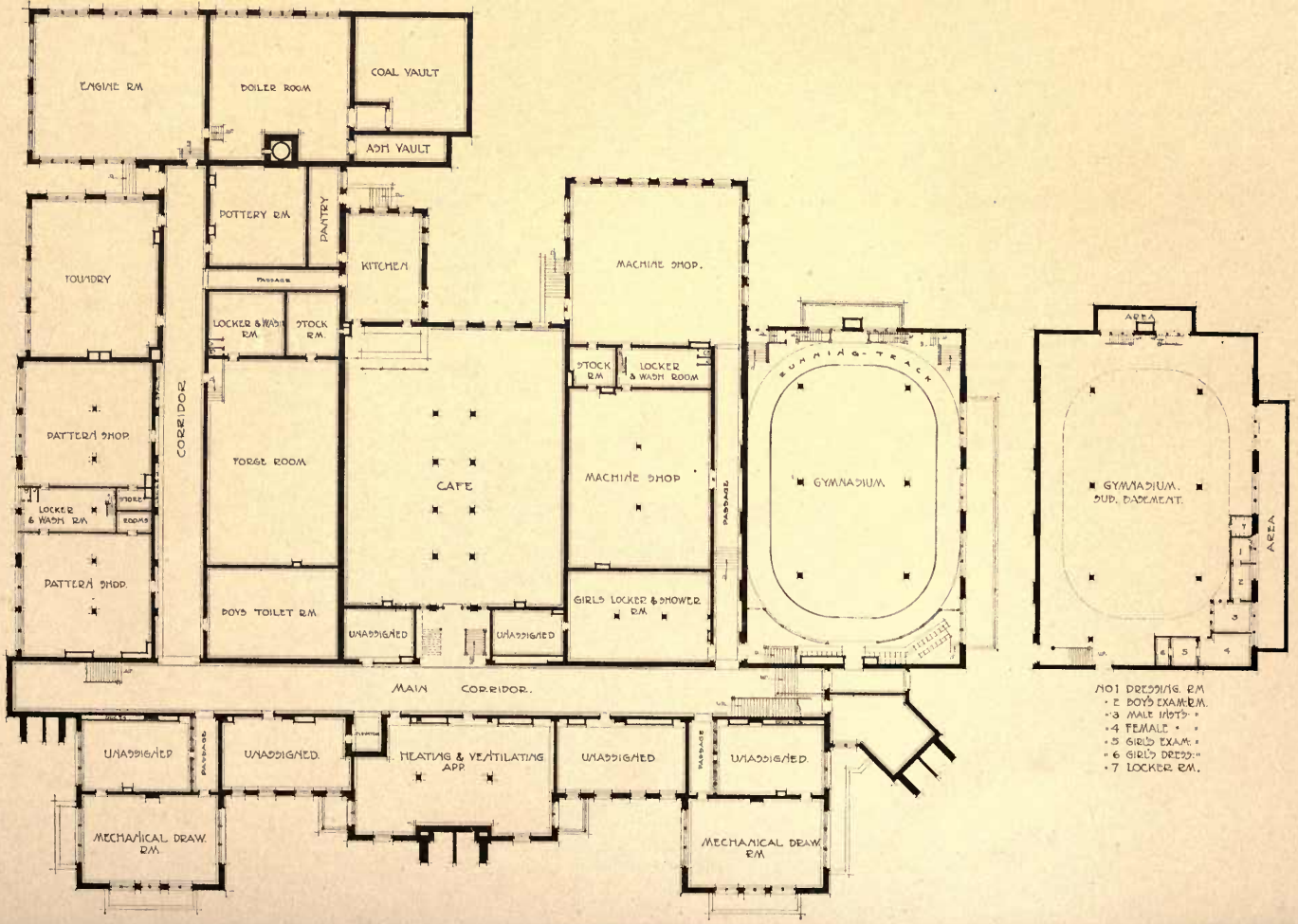
SECOND YEAR SCIENCE.

The course for girls is Household Chemistry. This deals with the general principles of chemistry applied to chemistry of foods, stains, and the effect of chemicals on various textiles and colors. The fuel values of foods, the digestibility of foods and the adulteration of foods are carefully investigated.

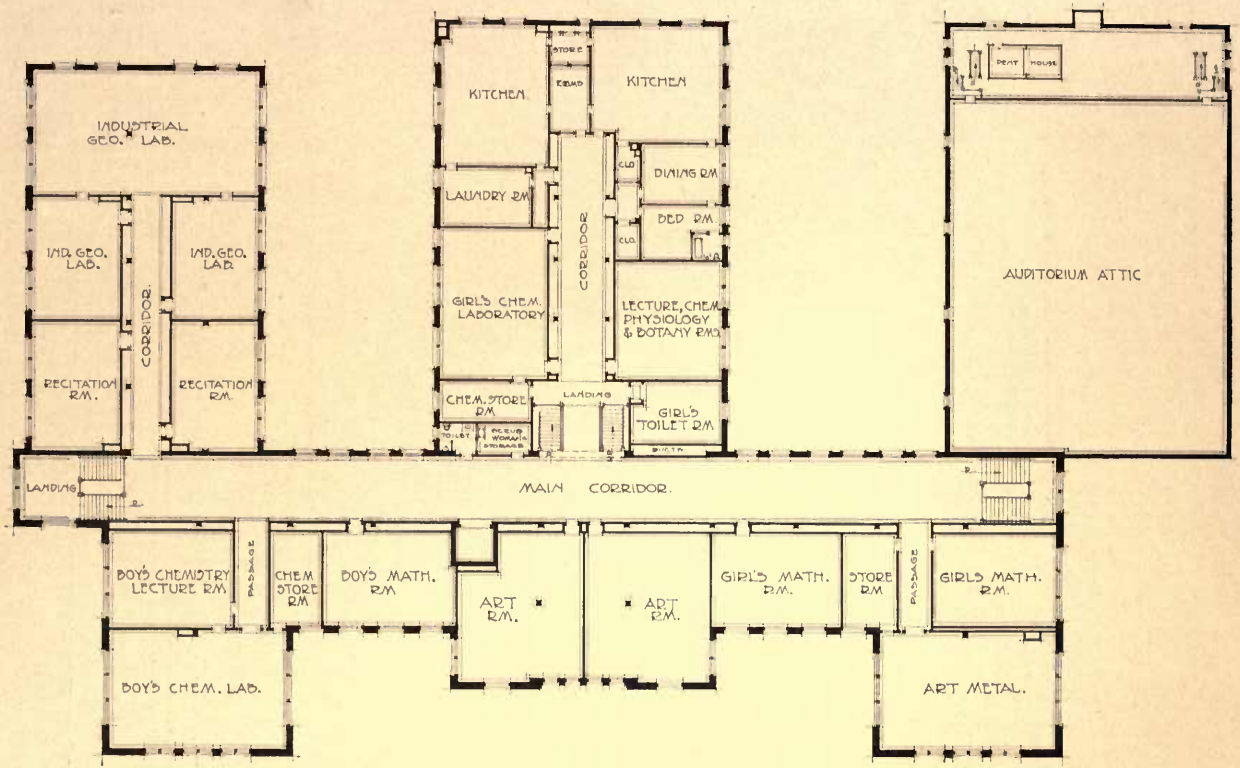
Elementary Chemistry, required of all boys the second year, is taught by recitations, demonstrations, and laboratory exercises. After the general principles of chemistry have been developed, the great commercial importance of the science is impressed on the pupils by a detailed study of the production of copper, aluminum, carborundum, and iron. The practical side of chemistry and its every-day uses are brought out by a consideration of such subjects as, hard and soft water, free alkali and other impurities in soaps, conversion of blacksmiths' iron into steel by the addition of carbon, and electro-plating of metals as copper or nickel. This work is covered by four recitations and one laboratory each week through the year.

THIRD YEAR SCIENCE.

In this year, Physics is the subject for both girls and boys. The course for girls is largely given for household



BASEMENT FLOOR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BED RM.
GIRL'S CHEM. LABORATORY
CORRIDOR
LECTURE, CHEM. PHYSIOLOGY & BOTANY RMS.
CHEM. STORE RM.
LANDING
GIRL'S TOILET RM.
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HOUSE
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MAIN CORRIDOR.
BOY'S CHEMISTRY LECTURE RM.
PASSAGE
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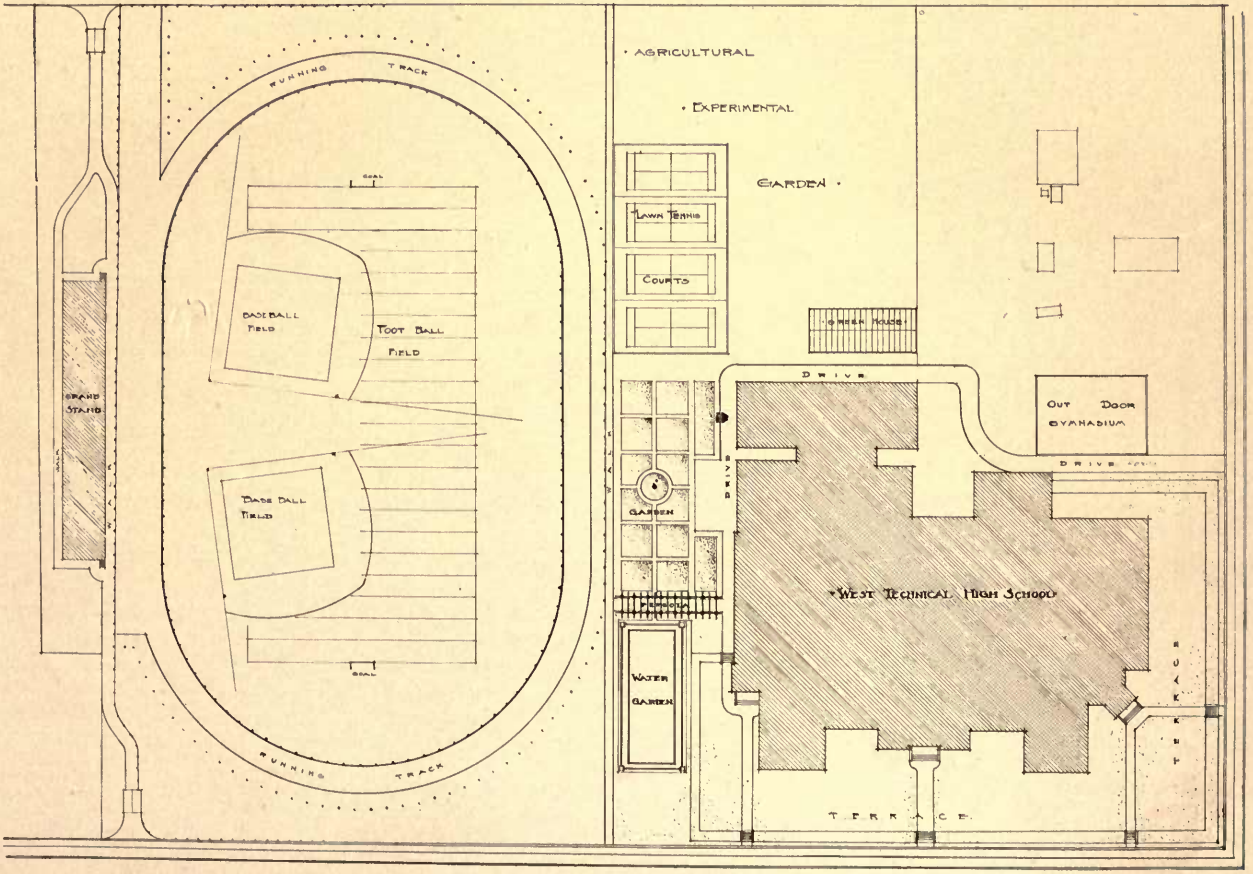
BOY'S CHEM. LAB.
ART METAL.

THIRD FLOOR



PLAN OF GROUNDS AND FIELD

arts' purposes. Much attention is paid to heating and ventilation of houses, to the effect of heat and moisture on various textiles, to the effect of artificial light on color.

The work for boys is devoted largely to mechanics and electricity. The course opens with a study of machines. While work more practical than is usual is undertaken, still the theory and mathematics of the subject are not neglected. In the mathematics the pupil has ample opportunity to use both his logarithms and his trigonometry.

HISTORY.

American History and Civics are required during the fourth year, while a year's course in Industrial History for the boys and in European History for the girls is offered during the third year.

The ultimate aim of the history course is to prepare the high school student for the proper exercise of his duties and privileges as an American citizen. To accomplish this it is hoped that the course in Industrial Geography closely followed by Industrial History will naturally lead to the work in American History and Civics, where many of the living questions upon industrial progress and governmental policies are discussed.

To quicken the interest in class room work and to investigate the actual work of government in practical phases, excursions are made to many of the municipal activities. This always brings about highly satisfactory results, for the student comes into direct contact with some of the problems with which the city is struggling.

A course in Mediaeval and Modern History affords to both boys and girls an opportunity to come in contact with European thought and development.

GERMAN.

Modern languages are elective during the third and fourth years. These courses do not differ widely from corresponding courses in other high schools. The first year is devoted to acquiring a working knowledge of the language. This means a careful study of both grammar and vocabulary. Some simple classics are read early in the first year. The usual literary classics are read during the second year and the language used in the class room is entirely foreign. It is not advisable for pupils who are not going to college to take this modern language work.

PHYSICAL TRAINING.

It is not too much to say that health, its provision and protection is all controlling in present day educational theory. It is realized that the connection between physical health and the power of voluntary control, and consequently of conduct, is very close. Preservation of health is, therefore, an aid to character building, and rational physical training is essential to sound scholarship.

The boys' course: A thorough physical examination of each student will be made and advice given to assist the individual in acquiring and maintaining a healthy body.

A required course in systematical and rational physical training will be given covering three periods per week, for all first and second year students, which will include lectures on personal hygiene, physiology of exercise, theory of different systems of physical training and kindred subjects.

An elective course is offered to Juniors and Seniors who desire a deeper knowledge of this subject, with a view to become instructors or assistants in gymnasium, or playground, or athletic work. This course will include lectures on the history, theory, and practice of gymnastics, and athletics; practice in taking physical measurements and examination of the heart, lungs, and senses; first aid to the injured and care of minor injuries. Ample opportunity will be given for practice in handling gymnastic classes and athletic teams.

The girls' course: The girls' course in Physical Training is given with the idea of obtaining four general results. First, that of education, in seeking to remove motor dullness and bringing out the characteristics of self-reliance, alertness, precision, and power of co-ordination; second, the hygiene result, to improve and maintain good health; third, the corrective result, to obtain a good posture and erect and graceful carriage; and fourth, the recreative result, for exercise must furnish enjoyment and recreation, if it is to be wholly beneficial. This course will consist of marching tactics, free standing and hand-apparatus exercises, aesthetic movements and folk dancing, simple exercises on the gymnastic apparatus, plays and games, and athletics.

At the beginning of each school year a physical examination is made of each girl and questions are asked regarding the condition of her health and habits of living, in order to give the director a working knowledge of that pupil's functional ability and vitality so that personal attention may

be given to her physical needs. A special class will be formed for any pupils who need individual corrective exercises for round shoulders or lateral curvature of the spine.

The outdoor work will be an important feature of the course. It is hoped that during nearly eight months of the school year it will be possible for the regular gymnastic work to be conducted out of doors. In addition to this all girls will be required to select several outdoor games and sports, included among the number of which are basket-ball, field hockey, tennis, a modification of indoor base-ball, walking and skating. The perfectly equipped shower rooms make it possible to require bathing as a part of the course.

Special elective courses in sex hygiene will be offered in the senior year.

Technical Work

MECHANICAL DRAWING.

This language of graphic art is essential to all lines of manufacture and the arts. It is a sign language by means of which the craftsman expresses himself. With this thought in view all drafting room courses are taught. This enables the pupil to express himself accurately and to use his initiative in the designing and in accurate drawing of what he must afterward construct in the shop or workroom. In so far as is possible the pupil designs what he is to make in the shop. A course in free hand sketching and designing is given and also a course in the reading of drawing.

The course in perspective and projection makes possible to the pupil the ideal drawing of the finished product in addition to the carefully prepared working drawings made in the drafting course.

The connection between shop and drawing makes it necessary for the pupil to either pass or fail in both subjects. That is, if a boy is taking pattern making, he is also taking pattern making drawing, and cannot fail in one course and pass in the other. The course in drawing is for four years.

THE SHOPS.

Since a general understanding of certain principles in the use of tools is essential to nearly all lines of manufacture, the course for the first and second years is definitely outlined for all pupils. Accuracy, good design and speed

are needed in every industry and to this end the pupil is held to direct account for the kind of work he produces. The accuracy and care required in the shops are as educative as any of the academic subjects.

The principles governing the handling and care of tools being common to all kinds of woodworking the pupil is first given work in pattern making where soft woods are used. Turning is taught in connection with the bench work. Here the pupil gets his first work at the lathe and bandsaw.

This course is as follows: First term, elementary pattern making; second term, elementary pattern making; third term, pattern making and foundry work. In the second year, one term each of cabinet making and forge shop are required. The third term is advanced cabinet making, advanced forging or advanced pattern making at the discretion of the pupil. In the third year one term of machine shop is required. The balance of the junior year and the entire senior year is open to the pupil for specialization.

DOMESTIC SCIENCE.

The course in Domestic Science covers four years, and is planned to be intensely practical and valuable to every girl. All subjects are taught which will help her to be a good home keeper, and make her surroundings healthful, comfortable, and attractive.

Besides the kitchens and laundry, there is a small suite consisting of dining room, bed room, and bath room, where the actual care and work of the home is demonstrated.

The main topic of the first two years is cooking and here the preparation of all the ordinary foods is learned, as well as the uses of the foods to the body, their digestibility, the effect of heat upon them, etc.

A closely correlated course in the chemistry of foods accompanies the cooking, and so from a study of the composition and properties of the various foods in the chemical laboratory, the pupil learns the *reasons* for what she does, and understands the principles which underlie and govern all cookery. Thus she knows *why* eggs should not be boiled, *why* cereals need a long cooking, *why* cold water is put on meat for soup stock and boiling water on a pot-roast, *why* baking powder is used with sweet milk and soda with sour milk, etc. She can then work intelligently and thought-

fully, instead of blindly trying to follow a meaningless rule.

Towards the end of the second year, the girls prepare and serve complete meals in the dining room, and here are learned the duties of hostess, and maid; formal and informal methods of serving, table etiquette, and general neatness and daintiness in dining room service. A study of food values, the proper combination of foods for well balanced meals, the cost of foods, planning of seasonable menus, and simple dietary computations are given with these serving lessons. Students are often surprised and delighted when they realize what a large number of good breakfasts, luncheons, and dinners they are able to prepare, and feel that they have really accomplished something worth while when they can be so useful and give so much pleasure to themselves and others.

In the third and fourth years, the work deals with other important phases of household management. In the laundry, the girl is taught how to wash and iron all common articles in the best and easiest way, to remove stains, wash flannels, and colored clothes, how to iron table linen, and embroidery, as well as to select good bluings, soaps, etc.

A simple course in Home Nursing is given which teaches the students how to keep a sick room healthful and comfortable, to care for invalids and children, to treat ordinary injuries and illnesses and what precautions and care are necessary in contagious diseases. Invalid cookery accompanies this course with special reference to the proper diet in various diseases.

Bacteriology, with its important applications to the general care of the house, canning, and the general preservation of foods, is also given a place in the curriculum.

In the last year, the keeping of accounts, marketing, house sanitation and decoration, the planning of houses, etc., are the topics emphasized, and some time is also devoted to advanced and fancy cookery.

Opportunity is also given to those who wish to specialize in cooking either for the purposes of becoming teachers of the subject or for catering. The café being under the direction of this department affords a fine practice school.

APPLIED ARTS.

Here is taught expression by means of free hand design. Flowers and fruits are sketched in black and white

and in color. Flowers are studied and their symmetrical parts noted. These parts are then conventionalized for the subjects for original designs both as to form and color. This is constructive work, as much so as is the designing of furniture and patterns in the mechanical drawing courses. The designs in applied art are for borders, yokes, embroideries, for pottery, art metal, and frescoes. As far as possible they are made to touch the daily life of the child. They mean something, are correlated directly with household decoration in domestic science, with the planning and sketching of dresses, millinery, and underwear, with good design in embroidery, in printing and in architecture.

SEWING, DRESSMAKING, MILLINERY.

In this department the aim is not only to give the girl some skill and the proper methods in needle and machine work, but to give her a proper appreciation of form, color, and fabric. Girls are taught to shop, to estimate values, draft patterns, fit dresses, make their hats completely and at small cost.

During the first two years they work on underwear and cotton dresses, the next two years in silk and woolen, and finer work in cotton and linen. The millinery work even to a greater degree than dressmaking enables the girls to use their initiative in design.

Opportunity for Specializing

During the third and fourth years pupils may devote extra time to the technical subjects for which they are best fitted. To this end the work is so arranged that during some quarters the pupil who so desires may spend as many as 20 hours a week in one line of work. The following statements show briefly what advantages are opened to the pupil.

AGRICULTURE AND HORTICULTURE.

Demands for work of this nature have lead to the offer of unusual opportunity in this direction. Instruction will be given by means of lecture, recitation, and experiment. By extensive use of the greenhouse connected with the school and the agricultural experimental gardens, it is expected that rapid progress will be made in gardening, farming, and horticulture.

The following topics will be treated: Domesticated Animals, Animal Production, Farm and Garden, Farm Crops, Soil Physics and the Seed Bed, Crop Production, Soil Fertility, Farm Bookkeeping, Animal and Plant Improvement, Heredity, Crossbreeding and Interbreeding of Plants, Cement Construction and Drawing, The Farmstead, Farm Machinery.

DESIGN.

This is an important course not only because of its own immediate value but as an adjunct to other lines of work. Good design is absolutely essential to the manufacturer, the architect, the decorator, and to the printer. Quite a field is open also to those who enter designing, engraving or illustrating as a profession.

PRINTING.

A practical course in printing is offered as an elective, In addition to the mechanical work of the printing trade it is hoped to instill some of the printing art into the pupil, to teach him correct form, good design and how to properly estimate costs. It is hoped that a pupil who has taken this work in connection with applied art may be of service to concerns who need men and women who can estimate costs in advertising, design acceptable covers, know a good title page, in fact be of value in printing work requiring initiative.

ELECTRICAL CONSTRUCTION.

The rapid advance along electrical lines has made it impossible for the number of skilled workmen to equal the demand. Electrical companies experience difficulties in securing intelligent workmen in this line.

This course covers all kinds of house and building wiring, switchboard work and armature winding, also a study of storage batteries. Coming as it does after he has had three years of science, the pupil has a foundation which makes his advancement rapid and sure.

DRESSMAKING AND MILLINERY.

These subjects are taught in connection with art and design. It is expected that the pupil will know good form and proper effects. Designing and drafting are taught so that pupils are not dependent on the purchase and use of

patterns. The millinery is designed and then fashioned completely from the raw materials.

COOKING.

Special courses in fancy cookery and in catering are offered for those who wish to specialize in this line or to become teachers of domestic science. The cafe being under the direction of this department offers an excellent practice school in this kind of work.

DRAFTING.

Drafting for advanced pupils divides naturally into machine design and structural lines. These courses are begun after the pupil has had two years of instruction in general drafting.

PATTERN MAKING.

After a year of elementary pattern making, a term each of cabinet making, forge shop and machine shop, the pupil may devote his technical time to advanced pattern making. This is carried on after the methods of the best commercial pattern shops and should lead to immediate remuneration to the pupil taking up this work.

MACHINE SHOP.

In these perfectly equipped shops there is every opportunity for the boy who wants to become an expert machine hand or who wishes to study tool making. His work in mathematics, mechanics, and drafting gives him a general understanding of machines, and tools not possible under an apprenticeship system.

CHEMISTRY.

Two courses in Chemistry are offered as electives in the fourth year, industrial chemistry and agricultural chemistry. The course in industrial chemistry is designed to meet the need of a more thorough understanding of the chemical character and possibilities of materials. Since every industry uses heat the subject of fuels is taken first. As it has been estimated that in Cleveland between 800 and 1000 tons of fuel are consumed each minute and no substitute has been suggested, we are justified in demanding that more attention be paid to fuel than has been in the past. The application of fuel to the different industries as

iron, steel, and cement will follow with an opportunity to branch out into electro-plating, photography, or special branches which students may have an opportunity to enter.

Agricultural chemistry is given by experimental lectures, recitation, and laboratory work including the following subjects: Ingredients of Plants, Food Requirements of Plants and their Sources, Soil Types—Potato and Truck Soils, Fruit Soils, etc., Chemical Composition of Soils, Soil Exhaustion and Conservation, Methods of Determining Needs of Soils, Farm Manures, Commercial Fertilizers and their Rational Use.

PHYSICAL TRAINING.

See regular course in physical training page 14.

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